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Title: Moisture Determination		
Revision: .04	Replaces: CLG-MOI.03	Effective: 05/18/2018

Contents

A. INTRODUCTION

1. Summary of Procedure

   A weighed sample is heated, cooled, and then re-weighed. The weight loss is calculated as moisture content.

2. Applicability

   This method is suitable for the determination of moisture in meat, poultry, and processed products at levels ≥ 0.5%.

   Note: Refer to 9CFR 439.1 for regulations involving food chemistry.

B. EQUIPMENT

Note: Equivalent equipment may be substituted.

1. Apparatus
   a. Covered aluminum dishes - 2-1/2" (63mm) dia, 1-3/4" (44mm) depth, 141mL capacity – Catalog No. 1183C43, Thomas Scientific.
   b. Mechanical convection oven - equipped with a booster heater.
   c. Robot Coupé® food processor - Robot Coupé U.S.A., Inc.
   d. Analytical balance - capable of weighing to 0.1 mg.
   e. Aluminum weighing dish with tab, 57 mm - Catalog No. 25433-008, VWR International.
   f. Aluminum weighing paddles - L-shaped, approximately 25 mm long, 12.5 mm wide.

2. Instrumentation

   None

C. REAGENTS AND SOLUTIONS

1. Reagents

   None

2. Solutions

   None

D. STANDARDS

None

E. SAMPLE PREPARATION

Process the sample until a homogeneous mixture is obtained. Take care not to lose moisture during processing.

F. ANALYTICAL PROCEDURE

1. Extraction Procedure
   a. Accurately weigh 3 to 6 g of sample (representing approximately 2 g of dry material) into a pre-weighed covered aluminum dish with (optional) aluminum weighing dish liner.
      i. Weigh the sample as rapidly as possible to minimize loss of moisture.
      ii. The weight of the pan should include the paddle, which is used in spreading the sample across the bottom of the pan, thereby presenting a greater sample surface area, which is beneficial to moisture removal.
      iii. If the sample is relatively dry when received, a small quantity of distilled water may be added to the pan only after the sample weight is obtained. This quantity of water will be helpful in spreading the sample across the bottom of the pan, and will introduce no error since it will be evaporated when the sample is oven-dried.
   b. Dry, with cover removed, for 16 -18 hours at 100 - 102 °C, or for 4 hours ± 10 minutes at 125 ± 1 °C in a mechanical convection oven. All oven thermometers are calibrated against a NIST thermometer.

      Note: Do not overload the drying oven or sample may be insufficiently dried and give low results. Drying time will start when the original temperature has been reached. Use the oven's booster heater, if the oven is so equipped, to minimize this recovery time.
   c. Remove moisture dishes from oven, cover dishes, let cool to room temperature and weigh the tin back.
2. Instrumental Settings

   Not Applicable
3. Sample Set (to be run as one set)
   a. Meat recovery

b. Samples (up to 20)

c. Meat recovery (safeguard)

G. CALCULATIONS

$$\text{Percent} = \frac{100(B - C)}{A}$$

A = sample weight
B = weight of dish + sample prior to drying
C = weight of dish + sample after drying

Note: If laboratory is not air-conditioned, and humidity may present a problem, it is advisable to desiccate dishes prior to the initial and final weighing.

H. SAFETY INFORMATION AND PRECAUTIONS

1. Required Protective Equipment - Safety glasses, laboratory coat, heat-resistant gloves

2. Hazards

   None

3. Disposal Procedures

   Follow federal, state, and local regulations.

I. QUALITY ASSURANCE PLAN

1. Performance Standard

   a. The meat recovery (or check samples) prepared at the beginning of the sample set shall have a ≤ 0.90% moisture difference from the reference value.

   b. Duplicate samples must be within ±0.64% of each other.

   c. The meat recovery (safeguard) prepared at the end of the sample set shall have a ≤ 0.64% moisture difference from the meat recovery prepared at the beginning of the set.

2. Critical Control Points and Specifications

	Record	*Acceptable Control*
a.	Sample size	3 - 6 g (representing about 2 g dry material)
b.	Dish size	≥ 50 mm diameter, ≤ 40 mm deep; with cover.
c.	Oven temperature	101 ± 1 °C for 16 -18 hours or 125 ± 1 °C for 4 hours ± 10 minutes after oven reaches temperature; Mechanical convection, forced-air oven. Check temperature with calibrated thermometer. Calibrate against a NIST thermometer.
d.	Oven loading	No dishes touching and not placed on solid tray; proper air circulation required.
e.	Oven recovery	Return to temperature within 10 minutes from door closing. Check and keep record, once per quarter.

3. Intralaboratory Check Samples

   a. System, minimum contents.

      i. Frequency: One per week, per analyst, when samples are analyzed.

      ii. Records are maintained.

   b. Acceptability criteria.

      Refer to I. 1

      If unacceptable values are obtained, then:

      i. Investigate following established procedures.

      iii. Take corrective action as warranted.

4. Sample Condition upon Receipt

   Unspoiled and sealed from the air.

J. APPENDIX

1. Reference

   Official Methods of Analysis of the Association of Official Analytical Chemists, 15th Edition, 950.46.

2. Minimum level of Applicability (MLA): 0.5%

K. APPROVALS AND AUTHORITIES

1. Approvals on file.

2. Issuing Authority: Director, Laboratory Quality Assurance Staff.